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ABSTRACT

The University of Wyoming (UW) teacher education program is a collaborative between UW faculty and educators from school districts throughout the state. Though the university faculty is charged with teaching teachers, the equally important "teachers of teachers" are the exemplary classroom teachers who provide modeling and expertise for preservice teachers. Throughout their training, students participate in campus-based coursework and classroom-based experiences at an assigned school site. There are four program elements: Phase 1, "Focus on Learning"; Phase 2, "Teacher as Decision Maker"; Phase 3, "Teaching Humanities, Literacy, Math/Science"; and Phase 4, a teaching residency. The university views technology as a powerful pedagogical tool, and focuses on using technology to improve student achievement rather than on the equipment and infrastructure. Students integrate technology into their individual and group projects and presentations and transfer new skills to the elementary school classrooms in their student teaching assignments. Teacher education students receive a "certificate of mastery" in the use of technology to improve student learning. (ND)

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Teacher Education and Technology: Improving Student Learning

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Statement of the Problem

The "global classroom" is a reality. Teachers and students can access intercontinental information in a matter of seconds. Technology is transforming the very nature and meaning of teaching and learning in the classroom. So, what is the problem?

Upon visiting many of today's classrooms, one notices a minimal use of technology. For the most part, classroom teachers lack the appropriate understanding and expertise to effectively use technology to maximize student learning and achievement. A particularly disturbing fact is that we generally find our schools "wired" for technology, but as Weinstein and Roschwalb (1990) observe, "unplugged" in terms of teaching and learning.

Schools are barely scratching the surface in the use of technology to enhance teaching from kindergarten to high school and beyond. With respect to technology, schools are creeping along in a Model T Ford, while other institutions are speeding along in a supersonic jet (Lindsey and Bailey, 1993).

Having worked in the public schools for over two decades as an elementary classroom teacher, a vice principal, a principal, and recently as a district superintendent, I have always believed the problem to be in the area of insufficient or inadequate staff development. Though I believed this to be the case and endeavored to implement appropriate staff development, my attempts were never successful in attracting more than a teacher or two in using technology for classroom instruction on a regular basis.

I have now come to believe that our focus was in the wrong place. What is happening at the university level in our teacher education programs? The answer is that the university has not responded quickly enough with relevant and practical training in the use of technology to improve teaching and student learning. We are sending "unplugged" beginning teachers to "wired" classroom environments.

Sarason (1993) stated that preventing problems is a lot more desirable and efficient than repairing them. To offer appropriate training in technology to teacher education students makes more sense than repairing the problem after they become teachers.

The University of Wyoming Teacher Education Program

The University of Wyoming teacher education program is based on the postulates proposed by John Goodlad and supported by the National Network of Educational Renewal (NNER), and is one of 16 collaborative settings in 14 states. Developed collaboratively by UW faculty and teachers and administrators from school districts throughout the state, the program provides many advantages over traditional teacher preparation programs.

The NNER settings are committed to improving schools and teacher education simultaneously. Three groups of faculty members - in schools, in college liberal arts departments, and in colleges of education - join in renewing teacher education programs conducted partly in partner schools for which they have improvement responsibilities.

In reflecting on the education of students in schools and of the adults who will teach them, these groups of faculty members cannot escape focusing similar critical attention upon themselves. They become engaged almost inevitably in a powerful sense of staff development. Consequently, the NNER is as much an inservice as a preservice teacher education enterprise and as much an exercise in school renewal as in the renewal of teacher education (Goodlad, 1996).

The University of Wyoming believes that teacher candidates must be exposed to many hours of actual clinical experiences in order to grow and develop into outstanding teachers. Though the university faculty is charged with teaching teachers, the equally important "teachers of teachers" are the exemplary classroom teachers who provide modeling and expertise for our teachers of tomorrow. Albert Shanker (1996) states that many teacher education programs present knowledge in a "piecemeal and disconnected manner." Theory is unrelated to practice; content knowledge is disconnected from teaching methods; instructional practices are unrelated to learning and development. In addressing quality and enhancement of the teaching profession, Shanker recommends:

> Collaboration with universities must occur to ensure that preservice programs for teachers require rigorous training in the academic disciplines and have strong clinical components that involve exemplary teachers both at field sites and as members of the clinical faculty of education departments. (p. 224)

Students at the University of Wyoming move through the program in cohort groups, designed to stimulate the collaboration and cooperation that occurs among professional teachers. Throughout their training, students participate in campus-based coursework and classroom-based experiences at an assigned school site (Figure 1).

Students complete Phase I through the community college of their choice or through the UW/Laramie College of Education program while completing 60 hours of classroom experience in the schools. Entering Phase II of the University of Wyoming/Casper College Center (UW/CC) program as juniors, students complete 90 hours of actual classroom experience in conjunction with their required coursework (one semester), and 270 hours of classroom experience in Phase III (three semesters). School assignment and grade level changes each semester. Entering their semester of residency, students bring 420 hours of actual classroom experience from their assigned Centers for Teaching and Learning (CTLs). The considerable classroom experience prior to residency, in most cases, results in the student functioning more as a teaching colleague than a student teacher.

PHASE I: FOCUS ON LEARNING

Students complete Phase I competencies through the community college of their choice or through the University of Wyoming College of Education program. Included are 60 hours of on-site experience in the elementary school classroom of one of the CTL partnership schools.

PHASE II: TEACHER AS DECISION MAKER

This is a one semester (six credit hour) experience which focuses on the culture of the school setting, classroom management, instructional strategies, and student assessment and evaluation. The blocked course includes concurrent UW/CC campus based coursework and clinical experiences at CTL partnership schools. Specifically, students are involved in classroom instruction for six hours per week and fieldwork experiences in the schools for an additional six hours per week, resulting in 90 hours of actual classroom experience with children and master teachers.

PHASE III: TEACHING HUMANITIES, LITERACY, MATH/SCIENCE

This phase is a three semester sequence of blocked courses (each six credit hours) which addresses the three specific disciplines of humanities, literacy, and math/science. During each course, students participate in UW/CC coursework and accompanying clinical experiences in CTL partnership schools. During these three semesters, students gain an additional 270 hours of actual classroom experience with children and master teachers.

RESIDENCY IN TEACHING

Students who have successfully completed prior phases are placed in the classroom full time during their teaching residency. This experience is similar to traditional student teaching , in that the residents work intensively with one master teacher. The experience differs from traditional student teaching because students have had considerable classroom observation and training (420) hours prior to the residency and are often able to function more as a teaching colleague.

FIGURE 1: OVERVIEW OF UNIVERSITY OF WYOMING/CASPER COLLEGE PROGRAM CONTENT

The Use of Technology in Teacher Preparation

The National Center for Education Statistics estimates that nearly half of the nation's public schools have access to the Internet or another wide area network such as CompuServe, America Online, or Prodigy. Sixty-seven percent of public schools have plans to implement or upgrade a wide area network (The ERIC Review, 1995). Although connecting to the online world is an important first step, what you do when you get there is the potential for the improvement of teaching, learning, and education decision making.

Recognizing a need for adequate and appropriate training in the area of technology, the University of Wyoming/Casper College Center (UW/CC) is making a commitment to preparing future teachers in the use of technology to improve student achievement. The University has purchased the necessary hardware and software and implemented appropriate staff development. Faculty have responded with the willingness to use technology for instructional purposes and recognize the importance of providing regular and ongoing opportunities for student involvement and participation.

Students are presently integrating technology into their individual and group projects and presentations and are transferring new skills to the elementary school classrooms at their CTL assignments. There is evidence of the regular classroom teacher's desire to use the newly acquired technological skills displayed by their teacher education students.

Each UW/CC classroom is wired for Internet access and connected to local, state, and international library systems. Instructors are establishing course web pages which are updated with syllabi, supplemental readings, schedules, exams, and hypertext links to various web sites around the globe. For example, students link to online writing labs (OWLS) to receive tutorial assistance with their writing skills and course text support on the World Wide Web. Each student has a free email account and communicates regularly with the instructor and fellow students.

The goal of the program is to improve the preparation of teacher education majors and student teachers in residency through the use of technology in real and practical instruction for elementary school children. The following objectives accompany the goal:

1. Teacher education majors are required to integrate the use of technology into their individual and group projects on campus and use the same in their elementary classroom fieldwork.

2. University instructors use technology in their delivery of instruction.

3. Teacher education majors become proficient in the use of Microsoft PowerPoint for presentations, Access for grading, and Excel for data collection.

4. Teacher education majors utilize the Internet and email to access additional classroom assignments, readings, and related information.

5. Teacher education majors become proficient in the use of StatMost (statistical analysis and graphics) for constructing surveys, collecting data, and analyzing results.

6. Student teachers are required to incorporate technology into instruction during their semester of residency.

The University of Wyoming views technology as a tool, but a very powerful pedagogical tool. Technology can bring students and teachers together, improve communication, and facilitate access to information. The focus is on the ***use*** of technology rather than the equipment and infrastructure.

Each Phase of the teacher education program builds upon specific and required competencies or outcomes. Before implementing the use of technology, these outcomes are examined and built into the application to assure the accomplishment of specific goals and objectives.

A careful consideration must be given to students moving beyond the acquisition of personal competencies in technological use. The emphasis must be on using the skills and competencies to improve student learning in the classroom. Using technology to assist in record keeping, grading, and word processing is one thing - using technology to promote and improve teaching and learning is quite another. The kinds of technology selected for use in the classroom can make all the difference between uninspired, rote computer use and challenging learning experiences for students (Raphael and Greenberg, 1995). Technology can enhance teaching, learning, and communication and provide access to lifelong learning.

Certificate of Mastery

Teacher education students receive a "certificate of mastery" in the use of technology to improve student learning. The certificate covers six separate competency areas and spans a 3 ½ year period. During the freshman and sophomore years (Phase I) students receive introductory instruction and training in computer use. During the first semester of their junior year (Phase II) students receive instruction and practical experience in using technology for presentation skills (e.g., PowerPoint), Internet navigation, email use, beginning web page design, and statistical analyses. Phase III involves three semesters of instruction with one semester in each of the curricular areas of Humanities, Literacy, and Math/Science. Students must demonstrate their technological knowledge and skill in each of these content areas. The instructor in each of the phases is responsible for seeing that the students meet each of the specific technological competencies.

The use of technology in the residency setting at the school site completes the certificate of mastery requirements. Students meeting the competencies in each of the six areas are awarded the Certificate of Mastery in the Use of Technology to Improve Student Learning. Each of the six competency areas are signed off during separate phases by a different instructor. This process assures consistent and ongoing instruction in using technology for improved teaching and learning.

Student Portfolios

While traditional assessment methods continue to be used in the UW/CC teacher education program, great emphasis is placed on the creation of an ongoing portfolio for each student. The portfolio begins in Phase I and continues to be updated and refined with each student's exemplary work in all areas of teacher education.

Though the purpose of the portfolio focuses on student growth and reflection, its completion during residency results in a powerful tool and asset for job interviewing. The portfolio is especially effective for the assessment of the student's use of technology to improve teaching and learning. Students include computer disk and video tape copies of many of their multimedia presentations in their portfolios. In addition to faculty evaluation, student performance is self-monitored and assessed on a continuing basis to assure the inclusion of examples of their best work.

Next Step: A Partnership Within a Partnership

The quality of the teacher education program at UW/CC has been enhanced through the partnership of the UW Teacher Education faculty, Casper Community College faculty, and the Natrona County K-12 School District. This partnership has also been the primary reason for a successful integration of appropriate training in technology into the teacher education program. With teacher education students in the classrooms throughout their training, existing classroom technological needs are readily realized.

UW/CC efforts to affect school improvement include teachers as authentic decision makers. Though the existing UW/CTL partnership is successfully accomplishing expected results, a need has surfaced for a group focused on the specific needs of technology in the classroom. A "secondary partnership," so to speak, is being formed to include classroom teachers, principals, university faculty, teacher education students, and parents having specific technological interests and expertise. The goal of this group is to help drive the specific technological instruction at the university level, and to improve the instruction in the elementary school classroom.

The university consciously respects and involves all of the partners in meaningful ways. The instruction at the university is genuinely related to the needs and desires of the teachers and students in the classroom.

For a variety of reasons the relationship between universities and schools has been characterized as a "fickle romance" (Wiske, 1989). The most successful projects have been those which all parties planned and prepared themselves well before starting the partnership, adequate resources were allocated to develop and maintain the activities, and mutual respect between the partners was consciously and systematically nurtured (Dodge, 1993).

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